

FINAL REPORT



# Federal Lands Alternative Transportation Systems Study

## *Congressional Report*

*prepared for*

**Federal Highway Administration  
Federal Transit Administration**

*prepared by*

**Cambridge Systematics, Inc.**

*and*

**BRW Group, Inc.**

August 2001

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*in association with*

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Bureau of Land Management  
U.S. Fish and Wildlife Service

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*August 2001*

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# Table of Contents

<b>Executive Summary .....</b>	<b>1</b>
<b>1.0 Introduction .....</b>	<b>3</b>
1.1 ATS Goals .....	3
1.2 Barriers to Success .....	4
<b>2.0 Assessment of ATS Needs .....</b>	<b>6</b>
2.1 Summary of ATS Needs .....	6
2.2 ATS Needs by Agency, System Status and Type of Expenditure .....	8
2.3 Potential ATS Needs by State .....	10
<b>3.0 Economic Impacts .....</b>	<b>12</b>
3.1 National Perspective .....	12
3.2 Local/Regional Perspective .....	14
<b>Appendix I</b>	
<b>Appendix II</b>	

# List of Tables

1.	Summary of Alternative Transportation System Needs on Federally-Managed Lands .....	7
2.	Potential ATS Needs by Agency, System Status, and Type of Expenditure .....	9
3.	Potential ATS Needs by State.....	11
4.	National Economic Effects (Potential Economic Impacts of Program Investment and Operations) .....	14

# List of Figures

1.	Summary of ATS Needs on Federally-Managed Lands.....	2
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# Executive Summary

Section 3039 of the Transportation Equity Act for the 21st Century (TEA-21) required the Secretary of Transportation, in coordination with the Secretary of the Interior, to “undertake a comprehensive study of alternative transportation needs in national parks and related Federal Lands.” The results of the Federal Lands Alternative Transportation Systems (ATS) study identified significant transit needs at sites managed by the National Park Service (NPS), the Bureau of Land Management (BLM), and the U.S. Fish and Wildlife Service (USFWS).

Many of these popular federally-managed sites are experiencing very high visitation levels that are continuing to increase. Site managers often view transit system implementation as a way to address the challenges created by these high visitation levels. Implementing transit on federally-managed lands can help achieve the following goals:

- Relieve traffic congestion and parking shortages;
- Enhance visitor mobility and accessibility;
- Preserve sensitive natural, cultural, and historic resources;
- Provide improved interpretation, education and visitor information services;
- Reduce pollution; and
- Improve economic development opportunities for gateway communities.



*Cades Cove, Great Smoky Mountains  
National Park, Tennessee*

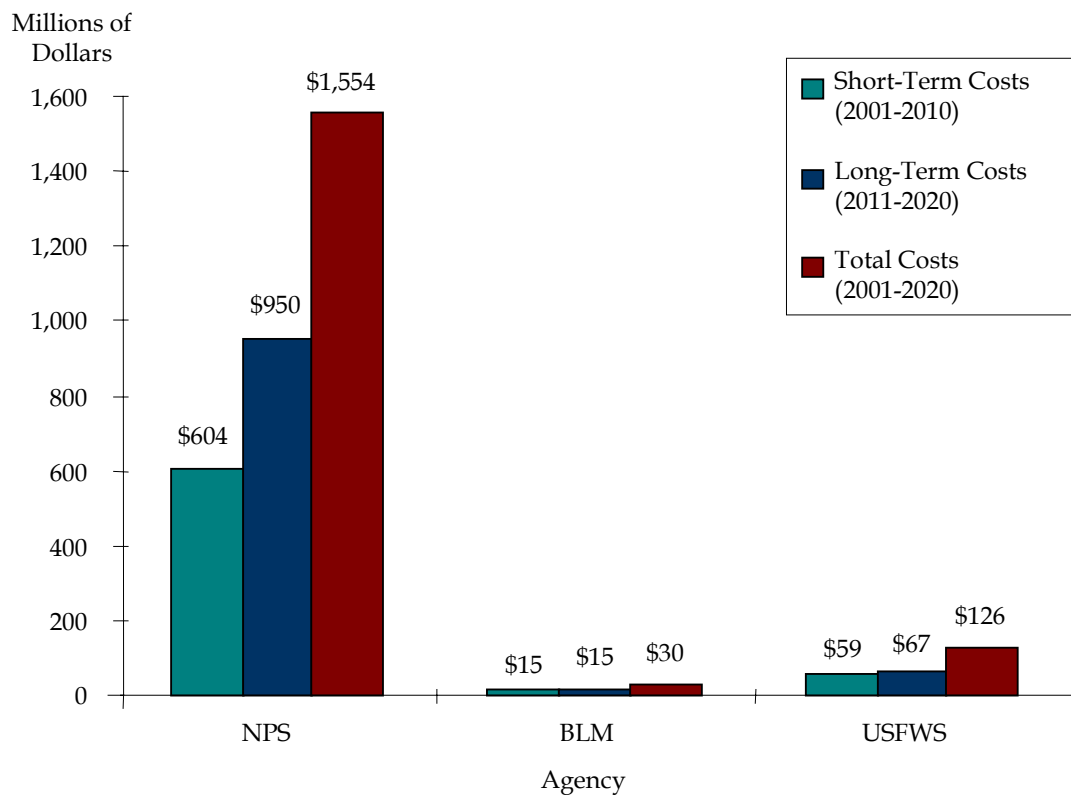
Transportation needs and resource preservation goals often work together to encourage implementation of transit services. Many sites can accommodate additional visitors but cannot provide the roadway and parking capacity required for additional automobiles. Reasons may include negative resource impacts of roadway and parking construction, prohibitive cost, or both. Many site managers believe that transit can serve as a cost-effective method of accommodating additional demand, while at the same time preserving resources and providing the visitor a more pleasant experience.

Two hundred seven sites were evaluated in the study; 85 with extensive field visits and 122 with telephone calls or brief visits. Transit needs were identified at 118 of 169 NPS sites that were included in the study, 6 of 15 BLM sites, and 13 of 23 USFWS sites. Transit needs include improving or expanding existing transit services as well as implementing new transit services. Bus transit is the most common form of transit service operation on Federal lands, and based on the study results, it will continue to be the predominant mode, although water transportation needs are significant as well.

In general, at sites where transit is feasible and prudent, needs are modest and can be served by a small number of vehicles operating on a seasonal basis. At many sites, there appear to be opportunities to recover at least a portion of operations and maintenance costs through fares. At a smaller number of sites, it may be possible to charge fares that are adequate to recover a portion of capital investment as well.

Needs were identified for both the short-term period (2001-2010) and the long-term period (2011-2020). The total need for the 20-period is estimated at approximately \$1.71 billion. Of this \$1.71 billion, approximately 40 percent (\$678 million) is required between 2001 and 2010, with the remaining 60 percent (\$1.03 billion) required between 2011 and 2020. Figure ES.1 summarizes the ATS need identified in the study.

**Figure 1. Summary of ATS Needs on Federally-Managed Lands**



The growth in costs between the short-term and the long-term periods is a result of two types of cost increases. Capital-intensive projects identified during the study that will require long lead times to plan and obtain funding are included in the long-term period costs. Secondly, the annual operations and maintenance costs increase substantially because of the greater number of systems operating during the long-term period.



## ■ 1.0 Introduction

Section 3039 of the Transportation Equity Act for the 21st Century (TEA-21) required the Secretary of Transportation, in coordination with the Secretary of the Interior, to “undertake a comprehensive study of alternative transportation needs in national parks and related Federal Lands.” The results of the Federal Lands Alternative Transportation Systems (ATS) Study identified significant transit needs at sites managed by the NPS, the BLM, and the USFWS. Two hundred seven (207) sites were evaluated in the study; 85 with extensive field visits and 122 with telephone calls or brief visits.

### 1.1 ATS Goals

Site managers often view transit system implementation as a way to address some of the challenges created by high visitation levels and increased levels of automobile traffic. Implementing transit on federally-managed lands can help achieve the following goals:



*Entrance to Rocky Mountain National Park, Colorado*

- **Relieve Traffic Congestion and Parking Shortages** – Sites such as the Grand Canyon, the Great Smoky Mountains and popular beach areas can accommodate more visitors but not more vehicular traffic. By providing transit services, fewer vehicles could transport a greater number of visitors to destinations within Federal sites and private vehicle parking spaces would be reduced.
- **Enhance Visitor Mobility and Accessibility** – Travel to, and within, Federal sites is primarily accomplished with private automobiles. Visitation to the site itself, or certain attractions within the site, can be restricted due to lack of roadway and parking capacity. Travel can be made much easier, and congestion reduced, by implementing trams or shuttle bus service. This enhances the visitor’s experience by permitting them to enjoy their site experience rather than concentrating on driving or finding scarce parking spaces. Additionally, transit can provide visitors with disabilities improved access to many sites.
- **Preserve Sensitive Natural, Cultural, and Historic Resources** – Parking lot capacities often do not meet parking needs, encouraging visitors to park on roadway shoulders and in other inappropriate locations, damaging the resources. Oftentimes, expanding the parking areas is incompatible with resource preservation needs. Transit can reduce parking demands in these areas and limit the amount of foot traffic in an area or locations where foot traffic is allowed.
- **Reduce Pollution** – Existing transit vehicle fleets often consist of old equipment with high particulate and noxious gas output. A dedicated source of funding would permit these vehicles to be replaced by new clean fuel technologies whenever possible. New

standard fuel vehicles, which have much lower emissions than the older vehicles, would be purchased where clean fuel technologies were impractical. Air pollution could also be reduced through transit implementation by decreasing the total number of vehicles accessing the sites. New transit vehicles, which operate much more quietly than older vehicles, would limit noise pollution.

- **Provide Improved Interpretation, Education, and Visitor Information Services** – Site managers identified opportunities to use transit to educate visitors about the environmental sensitivity of natural sites. At cultural and historical sites, transit can enhance the ability of site personnel to present past events in a logical, sequential manner.
- **Improve Recreational and Economic Opportunities** – Many sites are participating in regional initiatives to enhance recreational activities that extend beyond site boundaries, including hiking, bicycling and water-oriented recreation. Transit services can be used to transport people and their equipment to drop-off and pick-up points, thereby increasing the accessibility of recreational activities. Increasing accessibility through transit can increase the site visitation levels, resulting in additional economic revenues in the local communities through increased use of hotels, restaurants, and other visitor-oriented services.



*Chincoteague National Wildlife Refuge, Virginia*

## 1.2 Barriers to Success

This study identified a number of the barriers to successful implementation of transit systems. The following are some of these barriers:

- **Lack of a Dedicated Funding Source for Developing, Implementing, and Operating and Maintaining Transit Systems** – The FHWA administers the Federal Lands Highway Program (FLHP) that provides funding exclusively for the Federal Lands Management Agencies (FLMA). The FLHP primarily funds roadway and bridge projects, although three categories of FLHP funds may be used for transit projects: the Park Roads and Parkways Program, the Forest Highway Program and the Indian Reservation Roads program. When



*Boat Concession at  
Okefenokee National Wildlife Refuge, Georgia*

FLHP funds are used for transit projects, however, there are fewer funds available for roadway and bridge projects. There is currently a gap between the funds needed by the FLMAs to maintain their roads and bridges in current conditions and the funds made available through the FLHP. Therefore when FLHP funds are used for transit projects rather than roadway and bridge projects, this gap increases. Furthermore, public law prohibits the use of FLHP Refuge Roads Program funds for transit, and the BLM does not have a dedicated source of funding for transit.

In the case of other programs administered by the FHWA and the FTA, the vast majority of funding is distributed to State and local transportation authorities. For transit projects that primarily benefit FLMAs to receive these funds, these projects have to be sponsored by State and local transportation authorities, programmed through the statewide and metropolitan transportation planning processes, and deemed a higher priority than other State or metropolitan transportation projects. Although this approach has worked in some instances, the demands by State and local transportation authorities currently exceed available funding. Therefore, these programs cannot be considered as significant, stable sources of funds for supporting transit projects that primarily benefit the FLMAs.

- **Difficulty in Selecting Appropriate Equipment** – In general, the FLMAs do not have extensive expertise in the various transit technologies. Therefore, it is difficult for them to select the most appropriate technologies to be implemented for their specific needs.
- **Lack of Support for Transit Systems by Certain Gateway Communities** – Resistance to transit implementation has come from some gateway communities who fear that it is the first step in restricting or banning automobiles from the site causing reduced visitation and economic hardship for local residents. The FLMAs have indicated that automobile traffic will only be restricted when alternative transportation systems are provided to accommodate those visitors.
- **Inadequate Marketing and Public Information** – In some instances where optional transit services exist at a site, there should be additional marketing and public information efforts to increase public awareness of the transit services.
- **Technical Challenges** – The establishment of transit systems requires expertise in public transportation service planning, design, implementation, operations and maintenance. Most FLMA sites are unfamiliar with this type of project implementation and require significant assistance from transit experts.



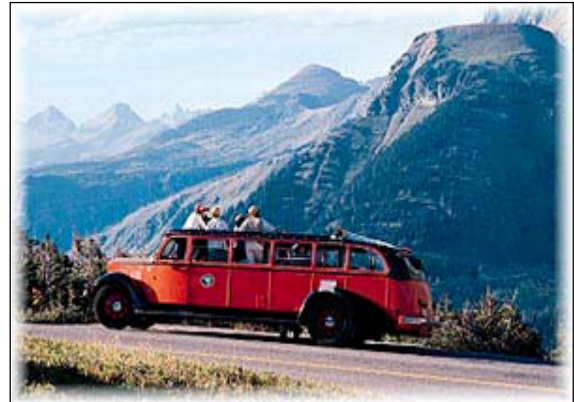
*Trolley, Adams National Historic Site,  
Massachusetts*



## ■ 2.0 Assessment of ATS Needs

### 2.1 Summary of ATS Needs

For the purposes of this study, Alternative Transportation Systems (ATS) refers to transit services. The study identified existing transit services that need to be expanded or modified, as well as new transit services. The identified transit needs include services that would operate completely within Federal sites, and services that would link Federal sites to surrounding communities. Transit vehicles identified in this study include trams, standard transit buses, small buses, historic trolleys, trolley cars, waterborne vessels, and aerial tramways. The transit needs identified fall into three primary types of transportation: bus transit, rail/guided transit, and waterborne transit. Bus transit is currently the most common mode of transit service operating on Federal lands, and is likely to continue as the predominant mode, although waterborne transit needs are significant as well. Because of the small number of rail projects identified, bus and rail needs are combined into a single “surface” transportation category in the report’s tables. The ATS needs cost figures in the study include project development costs, capital costs, and operations and maintenance costs.



*“Red Bus” – Glacier National Park, Montana*

The study identified transit needs for both the short-term (2001-2010) and long-term (2011-2020) periods. The total combined need for both short-term and long-term periods is estimated at approximately \$1.71 billion. Of this \$1.71 billion, approximately 40 percent (\$678 million) is required between 2001 and 2010, with the remaining 60 percent (\$1.03 billion) required between 2011 and 2020. Table 1 summarizes the ATS needs identified in the study.



*Santa Monica Mountains National  
Recreation Area, California*



*Russian River Ferry,  
Kenai National Wildlife Refuge, Alaska*

**Table 1. Summary of Alternative Transportation System Needs on Federally-Managed Lands\***

	Sites Demonstrating Need	Total Sites Evaluated	Short-Term Costs† (2001-2010)	Long-Term Costs† (2011-2020)	Total Costs† (2001-2020)
<i>National Park Service</i>					
Surface			\$510,000,000	\$ 827,000,000	\$1,337,000,000
Water			94,000,000	123,000,000	217,000,000
<b>NPS Total</b>	<b>118</b>	<b>169</b>	<b>\$604,000,000</b>	<b>\$ 950,000,000</b>	<b>\$1,554,000,000</b>
<i>Bureau of Land Management</i>					
Surface			\$ 6,000,000	\$ 7,000,000	\$ 13,000,000
Water			9,000,000	8,000,000	17,000,000
<b>BLM Total</b>	<b>6</b>	<b>15</b>	<b>\$ 15,000,000</b>	<b>\$ 15,000,000</b>	<b>\$ 30,000,000</b>
<i>U.S. Fish and Wildlife Service</i>					
Surface			\$ 40,000,000	\$ 53,000,000	\$ 93,000,000
Water			19,000,000	14,000,000	33,000,000
<b>USFWS Total</b>	<b>13</b>	<b>23</b>	<b>\$ 59,000,000</b>	<b>\$ 67,000,000</b>	<b>\$ 126,000,000</b>
<b>TOTAL ATS Needs</b>			<b>\$678,000,000</b>	<b>\$1,032,000,000</b>	<b>\$1,710,000,000</b>

\*Note: All estimates are in 1999 dollars and are not adjusted for inflation.

†Note: Total costs include project development costs, vehicle capital costs, other capital costs, and operations and maintenance costs.

The growth in costs between the short-term and the long-term periods is a result of two types of cost increases. A number of capital-intensive projects were identified during the study that will require long lead times to plan and obtain funding. Therefore, the capital costs for these projects are included in the long-term period costs. Secondly, the annual operations and maintenance costs increase substantially for this period because of the greater number of systems operating during the long-term period. At a majority of sites where transit is feasible and prudent, transit needs are modest and can be served by a small number of vehicles operating on a seasonal basis. At many sites, there appear to be opportunities to recover a portion of operations and maintenance costs through fares. At a smaller number of sites, it may be possible to charge fares that are adequate to recover a portion of capital investment as well.



Manitou Island Transit Ferry Terminal  
Leland, Michigan

## 2.2 ATS Needs by Agency, System Status and Type of Expenditure

Table 2 includes further details of the ATS needs on federally-managed lands. The table provides cost information categorized by agency, system status, and type of expenditure. The total up front cost (project development and capital costs) between 2001 and 2010 is \$292 million. The total up front cost between 2011 and 2010 is \$432 million.



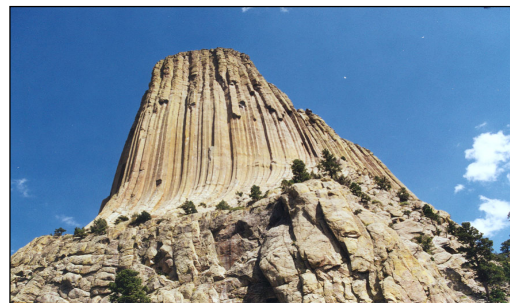
*Trams at Shark Valley,  
Everglades National Park, Florida*

The increased demand for new systems is the major factor driving the increase in projected needs between 2011 and 2020. Between 2001 and 2010 roughly half of the projected need is for existing and/or expanded systems and half is for new systems. Between 2011 and 2020, the proportion of projected need for new systems rises to approximately 70 percent, a result of the fact that a number of capital-intensive projects were identified for this period. These projects require a long lead time for planning, implementation, and funding.

Estimates were developed for project development, capital, and operations and maintenance costs. Project development costs include conceptual planning, engineering design, and environmental evaluation. Capital costs include vehicle capital costs and other capital costs. Vehicle capital costs include the costs of purchasing land-based vehicles (bus, tram, trolley, etc.) or waterborne vehicles (monohull, catamaran, etc). Other capital costs include maintenance and storage facilities, parking areas, docks, piers, administrative facilities, shelters and waiting areas, and construction management costs for projects requiring significant construction. Operations and maintenance costs include the full range of administrative, operating, and maintenance costs, including labor, benefits, fuel, parts, marketing expenses, and insurance.



*Assateague Island National Seashore, Maryland*



*Devil's Tower National Monument, Wyoming*

**Table 2. Potential ATS Needs by Agency, System Status, and Type of Expenditure\***

	Costs for Existing and Expansion of Existing Systems					Costs for New Systems				Total Up - Front Costs for Existing, Expanded and New Systems	Total Operations and Maintenance Costs
	Project Development	Vehicle Capital Costs	Other Capital Costs	Total Up- Front Costs†	Operations & Maintenance	Project Development	Vehicle Capital Costs	Other Capital Costs	Total Up- Front Costs†	Operations & Maintenance	
<i>Short Term (2001-2010)</i>											
BLM	\$ 45,000	\$ 450,000	\$ 0	\$ 495,000	\$ 2,419,800	\$ 429,875	\$ 1,375,000	\$ 1,607,500	\$ 3,412,375	\$ 9,265,600	\$ 11,685,400
FWS	979,700	2,995,000	2,642,000	6,616,700	8,817,800	1,736,550	4,665,000	5,481,000	11,882,550	32,061,300	40,879,100
NPS	21,659,119	93,298,125	42,066,000	157,023,244	147,646,800	14,317,742	54,480,000	43,516,945	112,314,687	185,881,340	333,528,140
	<b>\$22,683,819</b>	<b>\$ 96,743,125</b>	<b>\$44,708,000</b>	<b>\$164,134,944</b>	<b>\$158,884,400</b>	<b>\$16,484,167</b>	<b>\$ 60,520,000</b>	<b>\$ 50,605,445</b>	<b>\$127,609,612</b>	<b>\$227,208,240</b>	<b>\$386,092,640</b>
<i>Long Term (2001-2020)</i>											
BLM	\$ 22,500	\$ 450,000	\$ 0	\$ 472,500	\$ 2,419,800	\$ 161,625	\$ 1,475,000	\$ 50,000	\$ 1,686,625	\$ 10,443,800	\$ 12,863,600
FWS	281,850	2,995,000	0	3,276,850	8,817,800	2,207,800	9,150,000	3,912,000	15,269,800	39,842,500	48,660,300
NPS	8,367,606	94,973,125	10,743,000	114,083,731	151,895,800	40,223,272	129,240,000	127,904,000	297,367,272	386,456,340	538,352,140
	<b>\$ 8,671,956</b>	<b>\$98,418,125</b>	<b>\$10,743,000</b>	<b>\$117,833,081</b>	<b>\$163,133,400</b>	<b>\$42,592,697</b>	<b>\$139,865,000</b>	<b>\$131,866,000</b>	<b>\$314,323,697</b>	<b>\$436,742,640</b>	<b>\$599,876,040</b>
<b>TOTAL (2002-2020)</b>	<b>\$31,355,775</b>	<b>\$195,161,250</b>	<b>\$55,451,000</b>	<b>\$281,968,025</b>	<b>\$322,017,800</b>	<b>\$59,076,864</b>	<b>\$200,385,000</b>	<b>\$182,471,445</b>	<b>\$441,933,309</b>	<b>\$663,950,880</b>	<b>\$985,968,680</b>



It should be noted that for the BLM and the USFWS, the needs in the “other capital costs” category go down in the long-term period, and in several cases are reduced to zero. This is because “other capital costs” primarily include major items such as maintenance facilities, docks, and piers. It was assumed that the life of these facilities would exceed 20 years. Therefore, if such an investment were included during the short-term period (2001-2010) and there was no proposed expansion of the system during the long-term period (2011-2020) then no needs would be assumed in the “other capital costs” category during the long-term period. Vehicles and vessels, on the other hand, were assumed to have a 10-year life, so replacement needs are identified in the long-term (2011-2020) period.



*Rocky Mountain National Park, Colorado*

## 2.3 Potential ATS Needs by State



*Natchez National Historic Park, Mississippi*

Table 3 shows the total ATS needs in the short- and long-term periods, and the total ATS needs for the entire study period (2001-2020) by State. Table A.1, shown in Appendix I, includes a breakdown of the potential ATS needs in the short- and long-term periods by State, up-front costs and operations and maintenance costs. Table A.2, also in Appendix I, includes a further breakdown of the potential ATS needs by State, project development costs, vehicle capital costs, other capital costs, and operations and maintenance costs.

States with over \$10 million in capital needs identified for the 2001-2010 period are Alaska, California, Colorado, Washington, D.C., Florida, Hawaii, Massachusetts, Montana, Nevada, New York, Utah, and Washington. States that have an estimated need of over \$1 million annually in operations and maintenance costs are Alaska, Arizona, California, Colorado, Florida, Hawaii, Massachusetts, Michigan, New Mexico, New York, Texas, Utah, Virginia, and Washington. States with the largest increases in capital expenditures in the long-term period are Colorado, California, Massachusetts, Arizona, Wyoming, and Virginia.



**Table 3. Potential ATS Needs by State\***

State	Short-term (2001-2010) Total†	Long-term (2011-2020) Total†	Total 2000-2020 Costs†
Alaska	\$ 44,707,800	\$ 36,972,300	\$ 81,680,100
Arizona	37,389,525	90,708,875	128,098,400
Arkansas	2,957,500	2,940,500	5,898,000
American Samoa	6,988,600	3,106,100	10,094,700
California	69,432,150	222,128,150	291,560,300
Colorado	25,016,000	162,603,100	187,619,100
Connecticut		3,192,200	3,192,200
Washington, D.C.	24,000,000	21,000,000	45,000,000
Florida	41,077,900	31,973,700	73,051,600
Georgia	7,482,550	6,998,950	14,481,500
Hawaii	32,848,700	35,302,850	68,151,550
Indiana	392,600	369,100	761,700
Iowa	327,600	325,100	652,700
Kansas	5,074,000	10,090,900	15,164,900
Louisiana	2,181,500	4,620,800	6,802,300
Maine	4,017,594	3,831,281	7,848,875
Maryland	12,645,450	10,365,250	23,010,700
Massachusetts	68,550,275	108,360,925	176,911,200
Michigan	16,882,600	14,893,225	31,775,825
Minnesota	5,543,000	3,476,625	9,019,625
Mississippi	3,099,800	3,046,800	6,146,600
Missouri	5,284,300	5,219,550	10,503,850
Montana	25,163,050	18,759,450	43,922,500
Nebraska	859,200	854,200	1,713,400
Nevada	15,117,350	8,087,650	23,205,000
New Hampshire	599,600	597,100	1,196,700
New Mexico	22,526,000	22,158,500	44,684,500
New York	34,919,150	26,855,875	61,775,025
North Carolina	11,369,400	9,985,700	21,355,100
Ohio	7,713,700	9,310,150	17,023,850
Oregon	5,656,500	4,215,950	9,872,450
Pennsylvania	10,440,750	11,712,350	22,153,100
Puerto Rico	5,688,800	4,814,150	10,502,950
Tennessee	1,574,400	3,110,100	4,684,500
Texas	15,846,200	15,290,100	31,136,300
Utah	43,944,800	40,063,900	84,008,700
Vermont	933,100	933,100	1,866,200
Virginia	25,553,375	33,830,325	59,383,700
Washington	23,745,777	17,881,037	41,626,814
West Virginia	6,711,200	8,350,400	15,061,600
Wyoming	3,575,400	13,696,500	17,271,900
<b>TOTAL</b>	<b>\$677,837,196</b>	<b>\$1,032,032,819</b>	<b>\$1,709,870,014</b>

\* Note: All estimates are in 1999 dollars and are not adjusted for inflation

†Note: Total costs include project development costs, vehicle capital costs, other capital costs, and operations and maintenance costs.

Short-term total costs and long-term total costs are separated into up-front costs and operations and maintenance costs for each State in Tables A.1 and A.2, appendix I.

## ■ 3.0 Economic Impacts

The provision of transit in federally-managed lands can have national economic implications as well as significant economic benefits for local areas surrounding the sites. These local and overall economic effects can be relevant for project planning as well as for program financing.

Impacts on public and private sector revenues and spending patterns occur as a result of three basic forces: 1) capital investment in equipment and facilities; 2) ongoing transportation system operations; and 3) changes in site visitation and associated visitor spending. The economic impacts can also have very different interpretations, depending on whether they are examined from the viewpoint of the national economy or the viewpoint of local economic development. The economic impacts and benefits on a national and local level are discussed below.



*Multi-use Trail, Cuyahoga National Recreation Area, Ohio*

### 3.1 National Perspective

The implementation of transit service requires continued capital investment and ongoing operations activities. Based on the estimated level of investment and ongoing operations for these systems, the following types of economic effects are expected to occur:

- **Increased capital investment in transportation vehicles** – mostly buses, with some waterborne vessels and rail or other types of shuttle systems. Such vehicle purchases support vehicle manufacturers, and associated production-related jobs.
- **Increased capital investment in right-of-way and terminal facilities** – parking lots, benches, shelters, loading docks or piers, vehicle maintenance and storage facilities, and in some cases dedicated travel lanes or other right-of-way improvements. The construction of these facilities would provide construction-related jobs.



*Little Round Top, Gettysburg National Military Park, Pennsylvania*

- **Increased project development expenditures** – engineering, architecture, and planning design work for new transit projects. These expenditures generate income and jobs for design and planning firms.

- **Increased transportation-related employment** – operating and maintaining transit equipment and facilities that would provide jobs and income for vehicle operators and repair/maintenance workers.
- **Increased spending on suppliers of materials and services** – including suppliers of sheet metal, motors, rubber tires, plastic interior components, and other parts required by the vehicle manufacturers. It would also include suppliers of wood, gravel, cement, structural metal, or other materials needed for the facility construction. It would further include suppliers of motor fuel and replacement parts needed for ongoing operation of the vehicles.
- **Effects caused by the spending of income by workers** – when new jobs are created, they provide new sources of income that generate additional consumer spending demand, which creates the need for additional jobs.

### *Potential National Level Impacts*

The total capital and operating costs of ATS at all of the proposed sites were estimated and then summed to represent the national-level “direct effect” of the ATS program. The spending mix associated with these direct effects was also calculated based on available information about the types of vehicles, facilities and services being proposed.

These direct effects will generate additional flows of income and support additional jobs through the U.S. economy. The calculations of these flows of dollars, and particularly the indirect and induced effects, were calculated using the IMPLAN version of the national input-output model. That national model is primarily based on inter-industry purchase and spending data compiled by the U.S. Department of Commerce, Bureau of Economic Analysis.

Capital investment over the next 20 years, if all the transit needs identified in the study were funded, will involve \$650 million of one-time direct spending, and is estimated to ultimately support over \$1.9 billion in total business output (sales), providing over 16,000 job-years of employment and \$605 million in personal income in the U.S. Due to the equipment-intensive nature of vehicle manufacturing, the capital investment element of the program is expected to support roughly 25 jobs per million dollars of direct expenditure.

Project development expenditures are estimated to be \$90 million over the next 20 years. These professional service purchases are expected to generate \$287 million of output, support 3,500 job-years of employment, and provide \$118 million in income.

Average annual expenditures on operations and maintenance are expected to be \$49 million per year. These expenditures are estimated ultimately to support \$129 million in total business output (sales) each year, providing almost 1,900 jobs and \$54 million in total personal income every year. Due to the more labor-intensive nature of transit operations and maintenance, that element of the program is expected to support roughly 40 jobs for each million dollars in direct spending.

Table 4 summarizes these overall national economic effects described above. It is important to note that national spending on other types of programs or services (instead of transit) could also support jobs and provide income to workers within the U.S. Thus, these

figures represent just the economic effects of spending on the transit program, and do not reflect the opportunity costs of foregoing other possible uses of Federal funds.

**Table 4. National Economic Effects**  
*Potential Economic Impacts of Program Investment and Operations*

Category	Direct Program Expenditures	Total Effect – National Level		
		Output	Employment	Income
One-time Capital Expenditures	\$650M	\$1,929M	16,600	\$605M
One-time Project Development Expenditures	\$ 90M	\$ 287M	3,500	\$118M
Annual Operations & Maintenance	\$ 49M	\$ 129M	1,900	\$ 54M

All estimates are in 1999 dollars; total effects calculated using IMPLAN model for U.S.

### 3.2 Local/Regional Perspective

From the perspective of communities in the local area surrounding a Federal lands site, the economic effects of implementing transit are different from the national perspective:

- The effects of changes in *visitor spending* patterns, while viewed as a redistribution of spending at the national level, are potentially very significant for the local economies of affected areas. For some gateway communities, clogged roads, insufficient parking, or other problems of site access are now constraining the number of visitors or the length of time they stay in the community. In some of those cases, transit can expand the number of visitors to the site and expand the amount of visitor spending in the surrounding communities. The aggregate change in local spending is both a measure of direct economic impact on the local economy and an indicator of the increase in site visitation that reflects benefits to site visitors.
- The direct capital investment in *purchases* of transportation vehicles will generally not provide jobs or income to local workers unless there happens to be a manufacturer of transit vehicles in the local area. That does not appear to be the case for most transit sites. Therefore, this analysis assumes that vehicle purchases (bus, boat, etc.) fully affect the national economy but affect the relevant local economies to a much lesser degree.
- The direct spending on *construction* of right-of-way, docks and piers and terminal/maintenance facilities will provide local construction jobs and associated income for workers which would generally not occur without the transit investment. The construction activity would represent a net growth of jobs and income generated in the local area, as long as there are residents of the local area who could travel to the site to work on the construction.

- The direct *operations* activities would provide jobs and associated income for operators and maintenance workers that also will most likely not occur without the transit investment. Operations activity will provide a net growth of jobs and income generated in the local area, as long as there are qualified residents who could travel to work at the site.
- The broader *indirect effects* will be much smaller at the local level than at the national level, since they will occur only insofar as there are some local area suppliers of materials used in manufacturing or delivery of the vehicles (very limited in most cases) or local area suppliers of construction materials and services (generally applicable for most areas).
- The *induced effects* caused by spending of worker income will also represent economic growth at the local level, insofar as it represents additional dollars spent on food, clothing, and other consumer purchases which would not occur without the additional local jobs supported by the transit program.

The localized effects will differ by location, depending on 1) the expected change in visitation to the specific site, 2) the amount of visitor-oriented business activity occurring in surrounding communities, 3) the nature of the proposed ATS system construction and operation, and 4) the size and diversity of the county economic base (as a source of suppliers for related goods and services). Examples of localized effects are illustrated in examples shown in Appendix II.

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# Appendix I

**Table A.1 Potential ATS Needs by State, Up-Front Costs and Operations and Maintenance Costs\***

State	Short-Term 2001-2010 Costs		Long-Term 2011-2020 Costs		Total 2000-2020 Costs	
	Up-Front Costs†	Operations & Maintenance	Up-Front Costs†	Operations & Maintenance	Up-Front Costs†	Operations & Maintenance
Alaska	\$ 30,261,000	\$ 14,446,800	\$ 22,525,500	\$ 14,446,800	\$ 52,786,500	\$ 28,893,600
Arizona	10,246,675	27,142,850	26,238,625	64,470,250	36,485,300	91,613,100
Arkansas	426,500	2,531,000	409,500	2,531,000	836,000	5,062,000
American Samoa	4,260,000	2,728,600	377,500	2,728,600	4,637,500	5,457,200
California	27,029,550	42,402,600	68,157,150	153,971,000	95,186,700	196,373,600
Colorado	10,596,200	14,419,800	131,183,300	31,419,800	141,779,500	45,839,600
Connecticut			115,000	3,077,200	115,000	3,077,200
Washington, D.C.	24,000,000		21,000,000		45,000,000	
Florida	14,639,100	26,438,800	5,534,900	26,438,800	20,174,000	52,877,600
Georgia	1,903,950	5,578,600	1,420,350	5,578,600	3,324,300	11,157,200
Hawaii	16,695,350	16,153,350	15,467,900	19,834,950	32,163,250	35,988,300
Indiana	77,000	315,600	53,500	315,600	130,500	631,200
Iowa	55,000	272,600	52,500	272,600	107,500	545,200
Kansas	2,015,200	3,058,800	2,155,900	7,935,000	4,171,100	10,993,800
Louisiana	682,500	1,499,000	840,000	3,780,800	1,522,500	5,279,800
Maine	1,567,594	2,450,000	1,381,281	2,450,000	2,948,875	4,900,000
Maryland	5,977,650	6,667,800	3,697,450	6,667,800	9,675,100	13,335,600
Massachusetts	29,499,375	39,050,900	48,749,625	59,611,300	78,249,000	98,662,200
Michigan	6,331,800	10,550,800	3,290,225	11,603,000	9,622,025	22,153,800
Minnesota	2,991,000	2,552,000	924,625	2,552,000	3,915,625	5,104,000
Mississippi	286,000	2,813,800	233,000	2,813,800	519,000	5,627,600
Missouri	984,500	4,299,800	919,750	4,299,800	1,904,250	8,599,600
Montana	16,533,250	8,629,800	10,129,650	8,629,800	26,662,900	17,259,600
Nebraska	110,000	749,200	105,000	749,200	215,000	1,498,400
Nevada	10,068,550	5,048,800	3,038,850	5,048,800	13,107,400	10,097,600
New Hampshire	55,000	544,600	52,500	544,600	107,500	1,089,200
New Mexico	3,570,000	18,956,000	3,202,500	18,956,000	6,772,500	37,912,000
New York	16,230,350	18,688,800	8,167,075	18,688,800	24,397,425	37,377,600
North Carolina	5,685,600	5,683,800	4,301,900	5,683,800	9,987,500	11,367,600
Ohio	3,412,300	4,301,400	3,516,550	5,793,600	6,928,850	10,095,000
Oregon	2,814,100	2,842,400	1,100,950	3,115,000	3,915,050	5,957,400
Pennsylvania	2,307,750	8,133,000	2,123,750	9,588,600	4,431,500	17,721,600
Puerto Rico	2,149,200	3,539,600	1,274,550	3,539,600	3,423,750	7,079,200
Tennessee	210,000	1,364,400	367,500	2,742,600	577,500	4,107,000
Texas	2,408,200	13,438,000	1,852,100	13,438,000	4,260,300	26,876,000
Utah	11,528,000	32,416,800	6,741,500	33,322,400	18,269,500	65,739,200
Vermont	52,500	880,600	52,500	880,600	105,000	1,761,200
Virginia	7,742,775	17,810,600	13,290,925	20,539,400	21,033,700	38,350,000
Washington	11,400,637	12,345,140	5,535,897	12,345,140	16,936,534	24,690,280
West Virginia	3,072,800	3,638,400	3,295,200	5,055,200	6,368,000	8,693,600
Wyoming	1,867,600	1,707,800	9,280,300	4,416,200	11,147,900	6,124,000
<b>TOTAL</b>	<b>\$291,744,556</b>	<b>\$386,092,640</b>	<b>\$432,156,779</b>	<b>\$599,876,040</b>	<b>\$723,901,334</b>	<b>\$985,968,680</b>

\* Note: All estimates are in 1999 dollars and are not adjusted for inflation.

† Note: Total up-front costs include project development costs, vehicle capital costs and other capital costs.

**Table A.2 Potential ATS Needs by State and Type of Expenditure\***

State	Short-Term Costs (2001-2010)					Long-Term Costs (2011-2020)				
	# Transit Systems†	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance	# Transit Systems†	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance
Alaska	4	\$ 2,751,000	\$21,150,000	\$ 6,360,000	\$ 14,446,800	4	\$ 1,375,500	\$21,150,000		\$ 14,446,800
Arizona	9	1,190,175	3,850,000	5,206,500	27,142,850	11	4,104,625	15,800,000	6,334,000	64,470,250
Arkansas	2	36,500	390,000		2,531,000	2	19,500	390,000		2,531,000
American Samoa	2	710,000	200,000	3,350,000	2,728,600	2	177,500	200,000		2,728,600
California	16	3,669,550	15,190,000	8,170,000	42,402,600	20	5,890,650	44,315,000	17,951,500	153,971,000
Colorado	7	1,530,200	6,530,000	2,536,000	14,419,800	8	21,153,300	20,030,000	90,000,000	31,419,800
Connecticut						1	15,000	100,000		3,077,200
Washington, D.C.	1	4,000,000	20,000,000			1	1,000,000	20,000,000		
Florida	8	1,974,600	5,030,000	7,634,500	26,438,800	8	504,900	5,030,000		26,438,800
Georgia	2	196,950	1,335,000	372,000	5,578,600	2	85,350	1,335,000		5,578,600
Hawaii	6	1,984,350	13,480,000	1,231,000	16,153,350	6	898,900	14,155,000	414,000	19,834,950
Iowa	1	5,000	50,000		272,600	1	2,500	50,000		272,600
Indiana	1	7,000	50,000	20,000	315,600	1	3,500	50,000		315,600
Kansas	2	183,200	400,000	1,432,000	3,058,800	2	242,900	1,100,000	813,000	7,935,000
Louisiana	2	32,500	650,000		1,499,000	3	40,000	800,000		3,780,800
Maine	1	204,469	1,313,125	50,000	2,450,000	1	68,156	1,313,125		2,450,000
Maryland	3	528,650	3,425,000	2,024,000	6,667,800	3	272,450	3,425,000		6,667,800
Massachusetts	12	4,410,875	8,200,000	16,888,500	39,050,900	13	7,341,125	25,170,000	16,238,500	59,611,300
Michigan	3	1,055,300	2,370,000	2,906,500	10,550,800	3	373,225	2,710,000	207,000	11,603,000
Minnesota	1	498,500	800,000	1,692,500	2,552,000	1	124,625	800,000		2,552,000
Mississippi	2	26,000	220,000	40,000	2,813,800	2	13,000	220,000		2,813,800

\* Note: All estimates are in 1999 dollars and are not adjusted for inflation.

† Some sites have multiple transit systems.



**Table A.2 Potential ATS Needs by State and Type of Expenditure\***  
(continued)

State	Short-Term Costs (2001-2010)					Long-Term Costs (2011-2020)				
	# Transit Systems†	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance	# Transit Systems†	Project Development	Vehicle Capital Costs	Other Capital Costs	Operations & Maintenance
Missouri	3	89,500	875,000	20,000	4,299,800	3	44,750	875,000		4,299,800
Montana	2	2,440,250	9,425,000	4,668,000	8,629,800	2	704,650	9,425,000		8,629,800
Nebraska	1	10,000	100,000		749,200	1	5,000	100,000		749,200
Nevada	3	1,291,550	2,600,000	6,177,000	5,048,800	3	438,850	2,600,000		5,048,800
New Hampshire	1	5,000	50,000		544,600	1	2,500	50,000		544,600
New Mexico	4	520,000	3,050,000		18,956,000	4	152,500	3,050,000		18,956,000
New York	7	2,188,850	7,465,000	6,576,500	18,688,800	7	702,075	7,465,000		18,688,800
North Carolina	2	947,600	4,065,000	673,000	5,683,800	2	236,900	4,065,000		5,683,800
Ohio	4	390,300	1,890,000	1,132,000	4,301,400	4	343,550	2,190,000	983,000	5,793,600
Oregon	3	445,100	925,000	1,444,000	2,842,400	3	125,950	975,000		3,115,000
Pennsylvania	6	280,750	1,335,000	692,000	8,133,000	7	211,750	1,610,000	302,000	9,588,600
Puerto Rico	2	358,200	1,185,000	606,000	3,539,600	2	89,550	1,185,000		3,539,600
Tennessee	1	10,000	200,000		1,364,400	1	17,500	300,000	50,000	2,742,600
Texas	6	301,200	1,750,000	357,000	13,438,000	6	102,100	1,750,000		13,438,000
Utah	4	1,798,000	6,150,000	3,580,000	32,416,800	5	491,500	6,200,000	50,000	33,322,400
Vermont	1	2,500	50,000		880,600	1	2,500	50,000		880,600
Virginia	7	967,275	4,025,000	2,750,500	17,810,600	7	1,882,925	7,910,000	3,498,000	20,539,400
Washington	2	1,482,692	5,040,000	4,877,945	12,345,140	2	495,897	5,040,000		12,345,140
West Virginia	1	400,800	1,800,000	872,000	3,638,400	2	311,200	1,950,000	1,034,000	5,055,200
Wyoming	1	243,600	650,000	974,000	1,707,800	1	1,196,300	3,350,000	4,734,000	4,416,200
<b>TOTAL</b>	<b>146</b>	<b>\$39,167,986</b>	<b>\$157,263,125</b>	<b>\$95,313,445</b>	<b>\$386,092,640</b>	<b>159</b>	<b>\$51,264,654</b>	<b>\$238,283,125</b>	<b>\$142,609,000</b>	<b>\$599,876,040</b>

\* Note: All estimates are in 1999 dollars and are not adjusted for inflation.

† Some sites have multiple transit systems.

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## Appendix II

## Appendix II

The localized effects will differ by location, depending on a) the expected change in visitation to the specific site, b) the amount of visitor-oriented business activity occurring in surrounding communities, c) the nature of the proposed ATS system construction and operation, and d) the size and diversity of the county economic base (as a source of suppliers for related goods and services). These localized effects are illustrated through five examples.

For each of these examples, specific counties surrounding (or adjacent to) the federally-managed sites and their gateway communities were identified. Counties included in the analysis were those impacted economically by site visitation. The indirect and induced effects on those local counties were then calculated using county-specific IMPLAN models. These IMPLAN models provide different estimates of local (county) impacts for each site by accounting for the following factors:

- The levels of business activity to be supported in each county will differ depending on the nature of the ATS spending and the projected change in visitor spending. Those projects requiring less equipment and more operators, and those projects with larger ATS impacts on visitation will also tend to have larger local job impacts.
- The levels of business activity to be supported in each county will also differ depending on the portion of total spending which goes to local firms, as opposed to suppliers outside the county. Those counties with larger and more diverse business sectors will tend to keep more of the business sales for goods and services suppliers within the county.

The level of income generated in each county will further differ depending on the average wage levels in that county. Those counties with higher wage rates will also provide more income per job.

***Chincoteague National Wildlife Refuge and Assateague National Seashore (Accomack County, Virginia)*** – One potential proposal for Chincoteague National Wildlife Refuge includes tram service between the town, the visitor center, and the beach. The beach is currently operating below its carrying capacity on peak days because of parking constraints. The proposed improvements would allow the site to serve an additional 24,000 visitors and, as shown in Table A.3, would result in \$1.2 million in new visitor spending yearly dependent on the availability of local accommodations. This increased demand for food, lodging, and retail purchases could expand local business sales (including indirect and induced effects) by almost \$1.7 million, providing 47 jobs and a potential net growth of \$640 million in local income. The ATS operations and maintenance activities could lead to an additional \$132,000 in county-wide business sales, providing roughly three new jobs and a net growth of \$63,000 in local income. One-time capital expenditures could generate a further \$1.3 million in local business sales, providing \$436,000 in local personal income (with the equivalent of 17 local jobs for one year).

**Table A.3 ATS at Chincoteague National Wildlife Refuge**  
*Potential Local Economic Impacts on Accomack County, Virginia*

Category	Direct Program Effect	Total Effect on County Economy		
		Output	Employment	Income
One-Time Capital Expenditures	\$2,924,000	\$1,283,000	17	\$436,000
Annual Operations & Maintenance	\$ 215,000	\$ 132,000	3	\$ 63,000
Annual Visitor Spending	\$1,200,000	\$1,680,000	47	\$640,000

All estimates are in 1999 dollars and are not adjusted for inflation; the total effects were calculated using county-level IMPLAN model.

**Salem Maritime Historic Site (Essex County, Massachusetts)** – An ATS proposal for Salem includes establishment of a water ferry route connecting Boston and Salem. The availability of ferry service could result in 25,000 new visitors and over \$1 million of visitor spending annually in the Salem area. Of these visitors, 80 percent are expected to come from outside Essex County and many of them are expected to spend at least one night in the Salem area, thus increasing the demand for local restaurant, retail, and lodging services. In all, activity associated with tourist spending plus operation of ferry facilities will generate an additional \$2.2 million of business sales, providing over 40 jobs with a net growth of almost \$1 million in personal income (see Table A.4). One-time capital investment in construction of facilities and purchases of boats will also generate \$2.7 million in business sales, providing over \$1.1 million in local personal income (with the equivalent of another 32 local jobs for one year).

**Table A.4 ATS at Salem Maritime Historic Site**  
*Potential Local Economic Impacts on Essex County, Massachusetts*

Category	Direct Program Effect	Total Effect on County Economy		
		Output	Employment	Income
One-Time Capital Expenditures	\$4,867,000	\$2,702,000	32	\$1,129,000
Annual Operations & Maintenance	\$ 370,000	\$ 467,000	6	\$ 180,000
Annual Visitor Spending	\$1,090,000	\$1,720,000	36	\$ 730,000

All estimates are in 1999 dollars and are not adjusted for inflation; the total effects were calculated using county-level IMPLAN model.

***Merritt Island National Wildlife Refuge/Canaveral National Seashore (Brevard County, Florida)*** – An ATS proposal for Merritt Island National Wildlife Refuge includes two new shuttle buses and one new water ferry. These improvements will allow the site to serve over 20,000 more visitors per year. Although a majority of these new visitors will be day-trippers and thus generate less in the way of “new” economic activity, it is estimated 20 percent of the new visitors will be non-locals staying overnight, whose spending will generate new business sales in the county. In all, new “non-local” visitors plus ATS operations will together generate nearly \$1.7 million in business sales, providing roughly 39 jobs with a net growth of \$725,000 in local income (see Table A.5). One-time capital investment in the buses, vessels and ferry facilities will also generate nearly \$2.9 million in business sales, providing almost \$1.1 million in local personal income (with the equivalent of another 36 jobs for one year).

**Table A.5 ATS at Merritt Island National Wildlife Refuge/  
Canaveral National Seashore**  
*Potential Local Economic Impacts on Brevard County, Florida*

Category	Direct Program Effect	Total Effect on County Economy		
		Output	Employment	Income
One-Time Capital Expenditures	\$3,667,000	\$2,850,000	36	\$1,092,000
Annual Operations & Maintenance	\$ 270,000	\$ 220,000	4	\$ 105,000
Annual Visitor Spending	\$1,000,000	\$1,460,000	35	\$ 620,000

All estimates are in 1999 dollars and are not adjusted for inflation; the total effects were calculated using county-level IMPLAN model.

***Chiricahua National Monument (Cochise County, Arizona)*** – A shuttle bus system proposed for Chiricahua National Monument is expected to bring 42,000 new visitors to the site annually. These visitors, the majority of whom will be campers, could spend up to \$2.3 million in the local area (see Table A.6). In all, spending by the additional visitors, along with the economic impacts of the new transit system could together generate over \$3.4 million in business sales, provide up to 113 jobs and a net growth of nearly \$1.3 million in local income. One-time capital investments include \$400,000 in vehicle costs. Since there are no locally purchased capital items, business sales are zero.

**Table A.6 ATS at Chiricahua National Monument**  
*Potential Local Economic Impacts on Cochise County, Arizona*

Category	Direct Program Effect	Total Effect on County Economy		
		Output	Employment	Income
One-Time Capital Expenditures	\$ 400,000	\$ 0	0	\$ 0
Annual Operations & Maintenance	\$ 220,000	\$ 84,000	3	\$ 35,000
Annual Visitor Spending	\$2,350,000	\$3,320,000	110	\$1,250,000

All estimates are in 1999 dollars and are not adjusted for inflation; the total effects were calculated using county-level IMPLAN model.

**Gettysburg National Military Park (Adams County, Pennsylvania)** – The ATS proposal for Gettysburg is part of a larger park enhancement program which also includes a new, expanded visitor center. The ATS part of that program involves two shuttle bus services – one to take visitors from the visitor center to downtown Gettysburg, and a second to circulate around the park area. The visitor center and shuttle services are intertwined, so it is not possible to assign proportional credit to any of these components alone.

Overall, the addition of these services is expected to add 150,000 more visitors each year, as well as increase the average length of stay and amount of spending for the existing base of visitors. As shown in Table A.7 these factors will lead to an increase of over \$23 million in visitor spending in the Gettysburg area. In all, new visitors plus ATS operations will together generate over \$32 million in business sales, providing roughly 800 jobs with a net growth of over \$12.8 million in local income. One-time capital investment for the ATS alone will generate another \$816,000 of business sales, providing \$333,000 in local personal income (with the equivalent of another 11 jobs for one year).

**Table A.7 ATS at Gettysburg National Military Park**  
*Potential Local Economic Impacts on Adams County, Pennsylvania*

Category	Direct Program Effect	Total Effect on County Economy		
		Output	Employment	Income
One-Time Capital Expenditures	\$ 1,780,000	\$ 816,000	11	\$ 333,000
Annual Operations & Maintenance	\$ 295,000	\$ 294,000	7	\$ 143,000
Annual Visitor Spending	\$23,460,000	\$31,870,000	790	\$12,670,000

All estimates are in 1999 dollars and are not adjusted for inflation; the total effects were calculated using county-level IMPLAN model.

The specific examples above are meant for illustrative purposes only. With the exception of the Gettysburg National Military Park, none of the alternatives identified have been through a formal planning/project development process. However, the analysis clearly indicates that: 1) there would be a favorable overall economic impact from implementing transit; and 2) at sites where additional visitors can be accommodated, but additional automobiles cannot, implementation of ATS can provide communities with economic benefits, including increased income and employment.